

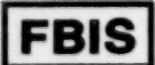
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18 September 1981

# USSR Report

HUMAN RESOURCES

No. 39



FOREIGN BROADCAST INFORMATION SERVICE

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## LABOR

### NEW STATUTE ON JOB PLACEMENT FOR YOUNG SPECIALISTS DESCRIBED

Moscow SREDNEYE SPETSIAL'NOYE OBRAZOVANIYE in Russian No 3, Jun 81 pp 41-44

[Article by A.P. Yegorov, department chief with the Planning-Financial Administration [PFU], USSR Ministry of Higher and Secondary Specialized Education: "Distribution of Young Specialists"]

[Text] On 1 September 1980 the new statute on the interdepartmental, inter-republic and personal distribution of young specialists graduating from higher and secondary specialized colleges came into effect.

The statute is legally binding on all ministries, departments, enterprises, secondary specialized schools and other establishments and organizations; it is made up of three sections: a general statement; interdepartmental and inter-republic distribution of young specialists; and personal distribution of young specialists who have graduated from higher and secondary specialized colleges.

In the first section the right of graduates from schools to work is underlined as a special achievement of our people; this right is guaranteed by the state. The obligations of young specialists are enumerated.

Offering work to young specialists using a planned procedure is one of the guarantees in protecting the rights of the citizens of the USSR and is written into the constitution of the USSR. Work for the young specialist in accordance with his profession is a civic duty and obligation for the young specialist.

In this section a definition is given of who is considered a young specialist and how much time he must work in his discipline after graduating from the VUZ or tekhnikum; the job-placement procedure for persons graduating from training schools after part-time study and so forth is also defined.

In the statute this is set out as follows.

A graduate from a higher or secondary specialized college who has completed the full course of training and has defended his diploma project (work) and who has passed the state examinations and been directed to work by the commission for personal distribution is considered to be a young specialist for three years after graduation from the training establishment.



Young specialists who have graduated from higher and secondary specialized colleges after full-time study are directed to work in accordance with the specialty and qualifications acquired in accordance with the plan for the inter-republic and interdepartmental distribution and the decision of the commission for personal distribution of young specialists in line with the procedure established by this statute.

Persons who have graduated from higher and secondary specialized colleges after part-time study can also be directed to work under the same procedure.

In this section the requirement is made to enhance the responsibility of the managers in USSR ministries and administrations, the councils of ministers of the union republics, and enterprises establishments and organizations, for utilizing young specialists correctly and rationally, consolidating them in production, creating good housing and everyday conditions for them and so forth.

The statute states that the USSR ministries and administrations, the union republic councils of ministers and the managers of enterprises, establishments and organizations are obliged to insure the correct and rational utilization of young specialists in accordance with their specialty and qualifications acquired at college, consolidate their positions in production, create for them the necessary housing and everyday conditions, raise the level of their theoretical and professional knowledge, and effect systematic control over their utilization.

Methodological guidance for the inter-republic and interdepartmental distribution of young specialists is effected by the USSR Gosplan, and guidance for personal distribution by the USSR Ministry of Higher and Secondary Specialized Education.

General guidance for probationary training of young specialists with a higher education is effected by the ministries and administrations and the enterprises, establishments and organization at which they are working, and control over this guidance is exercised by the USSR Ministry of Higher and Secondary Specialized Education.

State accountability for the fulfillment of the plan for the inter-republic and interdepartmental distribution of young specialists and their arrival at the designated place is reported using the procedure and within the periods set by the USSR Central Statistical Administration.

In the interests of further improving planning for the distribution of young specialists, for the first time the new statute includes a section on the procedure and periods for drawing up and confirming the plan for the inter-republic and interdepartmental distribution of young specialists.

The same section contains a procedure for compiling information on the graduation of young specialists and recommendations on their more correct utilization, and the provision of suitable places for them, together with the periods in which all this work is to be carried out.

The plan for the inter-republic and interdepartmental distribution of young specialists (hereinafter called the plan) is an integral part of the state plan for the economic and social development of the USSR.

The plan is drawn up by the USSR Gosplan by groups of specialties and specialties on the basis of proposals from the USSR ministries and administrations and the union republic councils of ministers, information on graduations, and extra requirements for specialists compiled in accordance with scientifically substantiated normatives for the numbers of specialists in the national economic sectors and standard lists of professions filled by specialists.

Plans for the distribution of young specialists with a higher education are compiled for periods of 1 to 3 or 5 years, and for those with secondary education for 1 year.

The procedure and time periods for the compilation and presentation of draft plans by USSR ministries and administrations and the union republic councils of ministers are established by the USSR Gosplan.

The forms and indicators, and also the methodological instructions for compiling draft plans, are worked out and confirmed by the USSR Gosplan.

Higher and secondary specialized colleges pass on to the ministries and administrations within whose control they fall, within the established periods, information about the total number of graduates by specialties (or groups of specialties) within the planned period, together with recommendations, agreed by the interested ministries and administrations, on the most purposeful way to employ them, taking into account the specialties they have gained, any special training, family circumstances, the period of residence and so forth.

The information on graduates receiving student grants paid for by funds from enterprises and organizations, and also on those registered in colleges on a noncompetitive basis, including those registered through the procedure for inter-republic and interdepartmental cooperation, includes first name, patronymic and family name, specialty, and the name of the enterprise, organization, ministry or administration that directed the graduate to his training.

The information on the graduation of specialists that have graduated from colleges after part-time study indicates the name of the ministry or administration at whose enterprise, establishment or organization these specialists work.

Enterprises, establishments and organizations make the calculations for extra requirements for specialists by specialty and pass them on to the department to which they are subordinate, using the established procedure.

The USSR ministries and administrations and union republic councils of ministers analyze and generalize the calculations for the requirements for specialists and the information on their graduation from colleges, and pass the results to the USSR Gosplan as follows:

calculations for extra requirements for specialists with higher and secondary specialized education by groups of specialties and specialties organized by territories and administrations;

information on the graduation of specialists from higher and secondary specialized colleges along with recommendations about the best way to employ them;

the necessary reference materials.

On the basis of the calculations for extra requirements for specialists, the information on the graduation of specialists from colleges, and the proposals submitted by the USSR ministries and administrations and the union republic councils of ministers, the USSR Gosplan acts as follows:

draws up a draft plan with the participation of the USSR ministries and administrations and the union republic councils of ministers;

confirms the plan and passes the plan targets to the USSR ministries and administrations and union republic councils of ministers.

Within a two-month period after the confirmation of the plan by the USSR Gosplan, the USSR ministries and administrations and the union republic councils of ministers draw up and confirm the following:

the plan for the distribution of young specialists for enterprises, establishments and organizations, republic ministries and administrations, the councils of ministers of the autonomous republics, and the ispolkoms of kray, oblast, and city (cities of republic subordination) soviets of working peoples deputies; and it passes on to them the plan indicators within a ten-day period following the confirmation;

plans for the distribution of young specialists graduating from higher and secondary specialized colleges in accordance with the plans of other USSR ministries and administrations and union republic councils of ministers; and it passes on the indicators for these plans to the appropriate USSR ministries and administrations and union republic councils of ministers within a ten-day period following their confirmation.

Within 20 days after receiving the plan, the ministries and administrations to which the young specialists are sent in accordance with the plan report to the ministries and administrations to which the colleges are subordinate the figures on the proposed disposition of the young specialists allotted to them by economic regions and the industrial centers of the country.

The ministries and administrations to which the higher and secondary specialized colleges are subordinate act as follows:

work out, with the participation of interested ministries and administrations, and confirm a plan for each college, taking into account the proposed disposition of specialists by territories of the country, along with recommendations from the colleges on their distribution, and within a two-week period submit the amended plan targets to the subordinate colleges using the established procedure;

report, during this same period, to the ministries and administrations to which it is intended to direct the specialists in accordance with the plan, providing a list of the higher and secondary specialized colleges and indicating the number



of young specialist graduates from these colleges, along with recommendations for their most purposeful employment.

The ministries and administrations to which the young specialists are directed act as follows:

within one month after receiving the list of higher and secondary specialized colleges and the number of young specialist graduates, draw up and confirm a plan for the distribution of the specialists by subordinate enterprises, establishments and organizations, taking into account the recommendations on their most purposeful utilization, and pass the plan to these sections [podrazdeleniya];

report to the ministries and administrations within whose jurisdiction the higher and secondary specialized colleges fall, with copies directly to the colleges, and within the time periods set by these ministries and administrations, submitting a list of work places and indicating the names and addresses of the enterprises, establishments and organizations, the posts to be filled, the salaries and the housing accommodation available.

Control over plan fulfillment is effected by the USSR Gosplan, the USSR ministries and administrations and union republic councils of ministers to which the young specialists are directed, and the ministries within whose jurisdiction the colleges fall.

The third section of the statute deals with the personal distribution of young specialists who graduate from higher and secondary specialized colleges. Its content corresponds in the main with the previous section except for a number of points that have been clarified.

In particular, the composition of the commission for personal distribution has been expanded; it now includes the leader (or deputy leader) of the college (the commission chairman) and representatives of the public organizations of the college and the ministries and administrations for which specialists are mainly being trained in any given college. The commission may also include representatives of the ispolkom of the local soviets of working peoples deputies and the chiefs of the appropriate faculties, sections and departments of the social sciences.

This section includes one new point. It deals with job placement for individuals who have not defended a diploma project and have failed the state examinations.

Students and undergraduates in day colleges who have not defended diploma projects (or work) and who have failed the state examinations can be directed for work in accordance with the decision of the commission for personal distribution of young specialists and used at work, taking into account the specialty for which they were training at college.

The procedure by which a graduate from a higher or secondary specialized college has an opportunity to find work independently is being tightened up: the statute now contains the provision that allowing graduates of higher and secondary specialized colleges an opportunity to find jobs for themselves independently should be regarded as the exception, and in all cases should be confirmed by the appropriate documents.



Ministries and administrations, and also the higher and secondary specialized colleges subordinate to them, will cooperate with such individuals in their search for work in their specialty.

For the first time the statute provides guidance on the documents used as the basis of young specialists' work contracts with the administration.

The certificate indicating the job posting forms the basis for the work contract between the young specialist and the administration of the enterprise, establishment or organization.

The range of individuals who have the right to sign the job posting of a young specialist is being extended. In accordance with the new statute, the leaders of enterprises, establishments and organizations have the right to release a young specialist within the three-year period in the following circumstances: a transfer to elected work (party, trade union, soviet or Komsomol work); the transfer of a husband (or wife) of a member of the armed forces of officer or supervisory status, and also the spouses of warrant officers and petty officers first class and other long-service military personnel in the USSR Armed Forces, and personnel of the organs of the USSR State Committee for State Security and the USSR Ministry of Internal Affairs to a new service assignment (work); the departure of a young specialist to be with parents who are groups I or II invalids in the absence of other work-capable family members; and loss of work capability by young specialists (groups I and II invalidism). When young specialists are released for any of the above reasons the leader of the enterprise, establishment or organization should inform the ministry or administration that directed the young specialist to work within 10 days.

The acceptance of such young specialists for work in a new position by managers of enterprises, establishments and organizations should be effected without the need for the presentation of the certificate for job posting issued at the end of training or the certificate permitting independent job placement.

When young specialists are returned to them, ministries, administrations and the higher and secondary specialized colleges are obliged to help them in finding work. The direction of these young specialists to work at their own request is completed by the ministries and administrations by their issuance of the certificate of job posting.

The new edition of the statute includes a point on the provision of housing for young specialists. It defines housing.

Young specialists are provided with housing (a self-contained living area for whose use a rental agreement is concluded) by the enterprise, establishment or organization to which they are directed for work. A place in a hostel is a temporary measure for providing accommodation for a young specialist.

In the event that no departmental housing is available to educational, cultural, public health, trade, personal services or legal institutions, state prosecutor's organs and organs of state statistics, city vocational and technical training

establishments within the system of the USSR State Committee for Vocational and Technical Education, and DOSAAF training and sports organizations, young specialists are provided with housing by the local soviets of working peoples deputies on application by the appropriate establishments and organizations.

The same procedure has been established for providing housing for young specialists who have been receiving a student grant paid for by the funds of enterprises and organizations or who were living in a hostel or rented accommodations before being sent for training.

The new statute contains no procedure for the payment of guaranteed salaries and adjustments to young specialists sent for work. The payment of guaranteed salaries and adjustments should be effected in accordance with existing legislation.

Young specialists who do not start work because of the military draft are paid a discharge salary equal in size to half of one month's grant (if he was receiving it at the time of graduation), and this is paid for by college funds.

Young specialists who are afforded an opportunity to look for work independently are not paid during vacations, except in cases where the certificate granting the opportunity to find work independently has been exchanged by the ministry, administration, enterprise, establishment or organization for a certificate of job posting.

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## LABOR

### EMPHASIS ON NONCHERNOZEM PROJECT CONTINUES

#### UzSSR Nonchernozem Region Resolution

Tashkent PRAVDA VOSTOKA in Russian 18 Jun 81 p 1

[Report on CPUz Central Committee and Uzbek SSR Council of Ministers decree on initiative of Goskomvodstroy collectives and Samarkandskaya Oblast workers regarding sponsorship of Vladimirskaia Oblast in RSFSR for agricultural development in line with 26th CPSU Congress decisions]

[Text] The working people of Uzbekistan, just as all other Soviet people, the decree states, were deeply pleased by the decisions of the 26th party congress and the subsequent decree of the CPSU Central Committee and USSR Council of Ministers "On the Further Development of the Nonchernozem Zone of the RSFSR During 1981-1985."

Constantly strengthening their fraternal ties with the great Russian people, expressing a desire to augment their contribution to the quickest possible development of agriculture in the Nonchernozem Zone, and guided by the words voiced by Comrade L. I. Brezhnev, general secretary of the CPSU Central Committee, when he presented the accountability report to the 26th party congress, in reference to the need for concerted effort by all republics in the quickest possible development of the Nonchernozem Zone of the RSFSR, the working people of Uzbekistan feel that it is their international duty to considerably intensify their sponsorship of agricultural development in the Nonchernozem Zone of the RSFSR.

The valuable initiative regarding the sponsorship of Vladimirskaia Oblast in meliorative construction and the comprehensive improvement of land was put forth by the collectives of the republic Goskomvodstroy [State Committee for Hydraulic Engineering Construction] and the workers of Samarkandskaya Oblast. Attaching great significance to this patriotic proposal, the CPUz Central Committee and Uzbek SSR Council of Ministers commended their initiative.

The proposal of the Uzbek SSR Goskomvodstroy regarding the organization of the Uzvladimirvodstroy Construction Trust in Vladimir in 1981 was adopted. The republic Goskomvodstroy has been ordered to:

Bring the trust volume of contracted construction and installation work up to a level corresponding to the second wage group in 1983;

Determine specific volumes of construction and installation work for 1981 and the five-year plan as a whole in conjunction with the Main Administration for Reclamation in the Nonchernozem Zone of USSR Minvodkhoz [Ministry of Land Reclamation and Water Resources] and with the approval of the Vladimirskaya party obkom and oblispolkom;

Organize a worker supply division in Vladimirskaya Oblast to begin serving the workers and employees of the Uzvladimirvodstroy Trust in July 1981;

Set up a division within the central administrative system to serve construction projects in Vladimirskaya and Novgorodskaya Oblasts, with the approval of the Uzbek SSR Ministry of Finance and within the limits of the total administrative personnel figure;

Send 30 graduates of hydraulic engineering and reclamation tekhnikums and the necessary number of specialists with a higher education to work for the Uzvladimirvodstroy Trust in 1981.

The Samarkandskaya CPUz Obkom and the oblispolkom were requested to work with the republic Goskomvodstroy to determine the necessary number of construction and reclamation workers for the planned volume of construction and installation work in Vladimirskaya Oblast during the 11th Five-Year Plan.

The Uzbek SSR Ministry of Finance must determine the maximum allocations for the maintenance of the personnel of the Uzvladimirvodstroy Trust and the worker supply division.

In annual plans for the distribution of produce, the Uzbek SSR Gosplan must envisage the allocation of agricultural products from Samarkandskaya Oblast, in line with the commodity turnover stipulated for the worker supply division of the Uzvladimirvodstroy Trust, in accordance with the orders of the republic Goskomvodstroy. Uzbekbriyash must arrange for the timely shipment of these products.

The Central Asian Railway Administration has been requested to allocate the necessary number of railroad cars to the republic Goskomvodstroy for the shipment of freight to Vladimirskaya Oblast. The Uzbek SSR Goskomsel'khoztekhnika [State Committee for the Supply of Production Equipment for Agriculture] must render maximum assistance in supplying the Uzvladimirvodstroy Trust with spare parts for excavation machinery and transport vehicles.

The Uzbek Komsomol Central Committee has been ordered to send student construction detachments to subdivisions of the Uzvladimirvodstroy Trust in accordance with the requisitions of the republic Goskomvodstroy, including 200 people in 1981.

The Uzbek SSR State Committee for Vocational and Technical Education must annually, beginning with 1981, send 150 seniors from secondary vocational and technical institutes to facilities of the Uzvladimirvodstroy Trust for on-the-job training.

The Uzbek SSR Trade Union Council, in conjunction with the republic Goskomvodstroy, will be expected to assist in the organization of mass socialist competition by the personnel and construction subdivisions of the Uzvladimirvodstroy Trust for



the fulfillment and overfulfillment of construction assignments for the 11th Five-Year Plan.

Obkoms of the Communist Party of Uzbekistan and oblispolkoms must work with the republic Goskomvodstroy in sending specialists and other personnel to Vladimirskaya Oblast on work assignments.

The Uzbek SSR Ministry of Culture, artistic unions and the Uzbek SSR Theatrical Society will organize cultural services for construction workers. They will regularly send artistic collectives and exhibits of works by republic artists to Vladimirskaya Oblast.

The editorial boards of republic newspapers and the State Committee of the Uzbek SSR for Television and Radio Broadcasting must give broad press, radio and television coverage to the construction work performed by Uzbekistan's emissaries in Vladimirskaya Oblast.

The CPUz Central Committee and Uzbek SSR Council of Ministers are firmly convinced that the initiative of the Uzbek SSR Goskomvodstroy and the workers of Samarkandskaya Oblast will further strengthen the friendship of the Uzbek and Russian people and make a fitting contribution to the implementation of 26th CPSU Congress decisions regarding the further development of agriculture in the Nonchernozem Zone of the RSFSR.

#### Uzbek Water Official's Views

Tashkent PRAVDA VOSTOKA in Russian 14 Jun 81 p 3

[Article by N. Kurbanov, chairman of the Uzbek SSR Goskomvodstroy: "On Novgorod Territory"]

[Text] Three years ago hundreds of Uzbek hydraulic engineers answered the party's call and began to develop land in the Nonchernozem Zone of the RSFSR, build new sovkhozes on this land, lay roads and erect large production complexes.

Meliorative personnel of the Uzbek SSR Goskomvodstroy were assigned to work in Novgorodskaya Oblast.

Our republic's emissaries were given a hearty welcome by oblast inhabitants. And why not? The people here have cherished the memory of the Uzbek fighters who, along with other subunits, defended the Novgorod territory. The fascists, who were trying to encircle Leningrad, were unable to break through this defense.

The Uparfinovodstroy Construction Administration was quickly set up in Parfino, the oblast regional center, and began operating efficiently.

It was immediately apparent, however, that the work would have to be performed under unfamiliar and difficult conditions. The Uzbek machine operators were quite experienced in desert work and had learned to move sand dunes to make way for irrigated fields. But how could they use their excavators and other equipment and their experience if they were surrounded by boundless swamps?

One day when Akhmedzhan Yarmukhamedov, an excavator operator, had just begun to install a drain pipe, he suddenly realized that his vehicle was slowly sinking. He glanced at his caterpillar tracks and, to his amazement, saw that they had sunk almost halfway into the soggy ground. The experienced machine operator did not lose his head, he instantly hitched the bucket of his excavator to a huge stump and managed, although with some difficulty, to crawl onto dry land. Several other machine operators had similar experiences.

Irrigation workers began to wonder how they could fulfill labor quotas and augment labor productivity under these conditions.

At this point, efficiency experts displayed quick thinking and resourcefulness. Excavator operator Erkin Ibragimov suggested that the caterpillar tracks be made wider. They tried it out, and it worked. The tracks of all excavators and bulldozers were modified.

At the same time, they were building temporary drains to divert subsoil water from swampy areas. When the lands had been drained and the main sewage system had been dug, the "temporaries" were covered.

As they say, experience takes time.

The Uzparfinovodstroy Administration was already performing work with an estimated cost of 2 million rubles in 1979, and over 3 million in 1980.

During this period, the **Uzbeks** who were working on the comprehensive construction of the Druzhba Sovkhoz had drained more than 815 hectares of land and had built large vehicle and industrial bases, dormitory facilities, a cafeteria, a kindergarten and nursery and more than 3,000 square meters of housing.

For the high indicators of their work in the fourth quarter of last year and the first quarter of this year, the construction collective was awarded the Challenge Red Banner of the USSR Minvodka and the Central Committee of the Agricultural Workers' Union. Outstanding reclamation workers won high government honors.

The Uzbek SSR Goskomvodkhoz gives its emissaries constant effective assistance. A worker supply division has been set up in Parfino to improve the irrigation workers' supply of foodstuffs and industrial commodities. Whereas construction workers had to live in trailers at first, many have now moved into comfortable living quarters with all the conveniences. There are also many who have moved with their families. Now that the period of adjustment is over, we can confidently say that people have settled down in the new location and are coping beautifully with the winters, which have not been as bleak as they expected. The Khamza neighborhood, where Uzbekistan's emissaries live, is acquiring increasingly distinct outlines on the outskirts of Parfino.

Goskomvodstroy is taking the necessary steps to organize a precise work schedule for irrigation personnel. For example, the land developers in the Nonchernozem Zone have been sent dozens of various motor vehicles, bulldozers and excavators. A material and technical supply office has been opened, facilities are being built for the manufacture of prefabricated ferroconcrete structures, and the construction of equipment repair shops has been completed.

Each year Uzparfinovodstroy is supplied with new highly qualified personnel: workers and engineering and technical personnel of the Goskomvodstroy system from virtually all oblasts in Uzbekistan.

The party and soviet organs of Novgorodskaya Oblast and the rayon are giving our republic's emissaries considerable assistance.

All of this allows us to look to the future with confidence. There will be much to do. The comprehensive construction of the Druzhba Sovkhoz has essentially just begun. In the next 5 years, 22 million rubles will be spent, 5,300 hectares of swampland will be drained, 700 hectares of land will be improved, and more than 22,000 square meters of housing will be built. Approximately one-fifth of all this must be done this year.

The results of the first 4 months testify that the virgin land developers are working at high speed. They have assimilated over 1.1 million rubles in capital investments and fulfilled the plan by 113 percent.

Many of Goskomvodstroy's emissaries are performing productive and spirited work. The brigade of bulldozer operators headed by V. Yevlamp'yev has achieved excellent indicators. One of the reasons for this subdivision's success is the introduction of the brigade contract method.

K. Agzamov worked as an excavator operator in Uzbekistan for more than 10 years. When he arrived in Novgorodskaya Oblast, the machine operator quickly mastered a new piece of equipment, a stump puller, and now he is fulfilling two work quotas each month.

Driver V. Tripolets is working just as productively as he did in his native Fergana and is fulfilling his assignments by 140-150 percent.

Many similar examples of the labor enthusiasm of irrigation workers and their creative attitude toward their work could be cited. The Uzparfinovodstroy collective has now armed itself with the slogan: "Lag-free work of high quality and maximum efficiency."

Of course, this presupposes the correction of existing defects. In particular, the work must be performed more quickly in some areas of the comprehensive construction of the sovkhoz, especially in land reclamation. The brigade contract method must be introduced on a broader scale.

It appears that the efforts of construction workers in this area will be productive.

The party and government have made a decision regarding further agricultural development and heightened efficiency in the Nonchernozem Zone of the RSFSR during 1981-1985.

The decision calls for a great commitment on our part. The Uzbek SSR Goskomvodstroy, which is backed up in its activity by the constant support of the CPUz Central Committee and the republic government, will do everything necessary for the attainment of set objectives.

UzSSR Secretary on Nonchernozem

Moscow NEDELYA in Russian No 27, 29 Jun 81 pp 2-3

[Interview with Yerezhep Aytmuratovich Aytmuratov, secretary of the CPUz Central Committee, by special correspondent A. Yevseyev, in Tashkent: "We Must All Work Together!"; date not specified]

[Text] If a conference is going on in CPUz Central Committee Secretary Ye. Aytmuratov's office on these hot summer days, the topic is almost certain to be the harvest. And this means that they are also discussing water. Not the water that falls from the sky, but the water sent to the fields by human hands. This is why a map of the republic is spread out on the Central Committee secretary's desk. The light blue veins stand for canals and the dark blue spots stand for reservoirs and irrigation systems. The only issue is water: where it can be found, where it should be sent first, which direction new canals should take, where new reservoirs should be built....

Although I had come here to find out what Uzbek reclamation workers were doing in the Nonchernozem Zone, my first question was naturally connected with the topic of discussion in this office: with the harvest, the republic's obligation and the present concerns of its farmers.

"Harvest prospects are good. In short, we will keep the promise we made at the 26th CPSU Congress: The country will receive 5.9 million tons of Uzbek cotton in the first year of the 11th Five-Year Plan," Ye. Aytmuratov said. "Of course, a great deal of intense work lies ahead, including work for hydraulic engineers and land developers. Life goes on, making increasingly high demands on all those who live by the land. Today our chief concern is the more economical and effective use of all our water management systems. We want to use them more efficiently. This means that we must remodel them and constantly improve our management of them. We are building new irrigation systems and are putting 100,000 hectares of new land to use each year. Furthermore, more than half of this land has been developed comprehensively. In monetary terms, this work has 'cost' slightly over a billion rubles."

[Question] What do you mean "comprehensively"?

[Answer] This means that we are not only establishing new irrigated fields, but are also building roads, housing, preschool establishments and clubs--everything needed to make these fields "work" successfully.

[Question] But now Uzbekistan's work in the Nonchernozem Zone has to be added to all of its other obligations. Just exactly what does this "addition" represent?

[Answer] It is equivalent to approximately 4 percent of all the hydraulic engineering work we are performing in the republic. But this figure means little to the uninitiated: In the Nonchernozem Zone we have completely different work conditions, a different climate, difficulties with roads, many swamps, and construction "rears" that are located 4,000 kilometers away. Therefore, if you want some idea of what our people are doing in the Nonchernozem Zone, it would probably be wiser to talk about the projected results of the Uzbek builders' work. This is the only way to clarify the actual volume of work they expect to perform.



[Question] On what areas are they concentrating?

[Answer] First of all, they have to build five new sovkhozes: two in Novgorodskaya Oblast, two in Ivanovskaya and one in Vladimirskaya. Furthermore, judging by all indications, this figure will rise. We will apparently be building one more sovkhoz in Vladimirskaya Oblast. All of them will be large vegetable, meat and dairy farms. They will include settlements of 300-400 residences apiece, facilities for large cattle, hothouses and machine repair shops. They will include 6,000-7,000 hectares of farmland: drained and irrigated land which will produce food for the cities and fodder for livestock. They will include a school, a hospital, a kindergarten, a cultural center and a cafeteria. In short, everything required for a normal life and work. This kind of sovkhoz (their names are Druzhba, Tashkentskiy and Uzbekistan) costs around 40 million rubles, and around 2,000 people will live there. In general, they represent modern agricultural cities with a high level of production. For example, the Tashkentskiy Sovkhoz will produce the same quantity of early vegetables as all of Novgorodskaya Oblast produced in 1975. When the Uzbekistan and Druzhba Sovkhozes start working at their projected capacity, they will produce more than 40,000 tons of vegetables, and if we add this to the quantity now being produced, it will completely cover the vegetable requirements of Ivanovskaya Oblast.

But, I repeat, the establishment of sovkhozes is not all that our reclamation and construction workers are doing. In the next 5 years they will have to transform 50,000 hectares of swampland into fertile fields, irrigate 13,000 hectares of arid lands and remove all the stones and shrubs from 20,000 hectares of wasteland. They will build 120,000 square meters of housing. And even this does not complete the list: I have not said anything about the road construction we are conducting or about our participation in the establishment of a massive construction base in the Nonchernozem Zone, without which the gigantic program for the development of this region could never be completed. Our contribution to this project consists of plants for the production of ferroconcrete structures, with a capacity of 100,000 cubic meters, and keramzit panels.

[Question] Now let me ask you about the Uzbek builders' first steps in the Nonchernozem Zone. Specifically, why was Novgorodskaya Oblast chosen as the site of your first "landing"? Was it because many soldiers from Uzbekistan fought in the battle near the walls of this ancient city during the Great Patriotic War?

[Answer] Yes, you could say that this was one of the reasons, although soldiers from Uzbekistan fought on all fronts. But many people in our republic are quite familiar with the Novgorod territory. Some of them fought on the northwestern front and saw it with their own eyes. They remember its trees and lakes and, what is most important, they know what the war did to it. Others have never seen it, but they also have their own special attachment to the Novgorod territory: Their fathers, sons and brothers will spend eternity there. This is why we feel deeply responsible for the future of this ancient territory, for which the soldiers of our republic gave their lives.

But you wanted to know about the Uzbek builders' initial move to the Nonchernozem Zone. Everything went according to tradition: trailers, tents, special trains carrying equipment--excavators, motor vehicles, cranes and bulldozers (they brought everything with them from Uzbekistan). They unpacked, took their bearings and

looked around. They were greeted warmly. They gasped at the sight of the trees and water all around them. More trees and water than anyone from Uzbekistan had ever seen.... But then the cold season arrived. This was in late fall 1974. But it was all right; they coped with the cold too. They adjusted completely and grew accustomed to the winter and to the torrents of rain. Some people have already settled for good in Russia. Some have married and have started families. Children have been born. One worker even had twins: one daughter named Nadezhda and another named Nargis. Imagine: an Uzbek man from Novgorod, an Uzbek woman from Vladimir! But so what, this sounds just fine!

Of course, the tent towns disappeared long ago. Our builders live in comfortable dwellings. One settlement is called Khamza, named after the great Uzbek writer. The settlements we built have their own tea-houses, and bakeries where the traditional Uzbek flat cakes are baked. I have been told that the local inhabitants have already tasted their splendor, and the cakes are now being bought up right and left by the Russian population. Cultural exchange is now beginning to supplement this "dietary" exchange, as it should. For example, a large exhibit of the works of Uzbek artists and master folk craftsmen was held in Novgorod. This was followed by a reciprocal visit to Tashkent by Novgorod's Sadko folk ensemble.

[Question] As I recall, in their native land the Uzbek irrigators were mainly concerned with providing fields with water, but in the Nonchernozem Zone they have to do the opposite: They have to drain swampland. Does this require retraining?

[Answer] Why? Ditches, canals, gutters, headers and drainage networks are required in both cases. And who said that the Nonchernozem Zone does not need water? There is a need, a great need! After you drain a field and give it a chance to live, you must give it something to drink. Are there no dry and rainless summer months, no droughts in Russia? This is why we are building reservoirs, pumping stations and head races and installing sprinkler systems and even drainage systems, with the aid of which surplus water can be returned to the fields if necessary. This is called a "controlled recycling system."

[Question] Please say a few words about the people, those to whom Uzbekistan has entrusted the important and difficult mission of representing it on Russia's fields.

[Answer] They are the most highly qualified workers. Most of them are young. Our collectives consist of around 5,000 people. Of course, there are 2,000 or 3,000 more in the summer. Komsomol and student detachments are working successfully here. We have opened vocational proficiency schools in the Nonchernozem Zone for those who do not qualify as specialists in construction or reclamation.

[Question] The natural conditions of Uzbekistan are quite different from those of Russia....

[Answer] Well, what can I say? People have to adapt.... Here in Uzbekistan we can work to the utmost (and we do, of course) all year; the weather is good all year. But in Novgorodskaya Oblast this is not possible: It has rain, snow and frosts. It is a good thing that we are now acquiring new equipment which can perform meliorative work (and this, you understand, is the kind of work I am referring

to) at any time of the year. Now we can lay drain pipes even when the ground is frozen. We can boldly work in swamps without the fear that we will "lose" our vehicles.

[Question] Even if we disregard the weather, you probably have enough problems.

[Answer] Yes. We do have other problems. The most pressing is probably our difficulty with shipments of construction materials, some of which still have to be shipped from Uzbekistan. Just imagine what these shipments cost! It is true that the situation is improving now that many quarries and construction industry bases are being built. Apparently, soon we will have adequate local supplies of sand, gravel and ferroconcrete. Another big problem is the need for better technology. There is, for example, a method for the continuous laying of drain pipes. But there is one "minor" requirement: "endless" plastic pipe. This would quadruple the speed of pipe laying operations! But plastic pipe is still scarce because the chemical industry is producing very little. So we are using the old method: We are putting clay pipe into the ground, and this is a costly, inconvenient and not very productive process.

[Question] In his report at the 26th CPSU Congress, Leonid Il'ich Brezhnev said that the task of developing the Nonchernozem Zone must be accomplished collectively, through concerted effort by all republics. We know that many union republics are participating in carrying out the program for the development of the Nonchernozem Zone. What kind of work experience could the emissaries from your republic share here?

[Answer] As you know, Uzbekistan was among the first to send its reclamation and construction workers to the Nonchernozem Zone, soon after the publication of the well-known decree of the CPSU Central Committee and USSR Council of Ministers "On Measures for the Further Development of Agriculture in the Nonchernozem Zone of the RSFSR." In 1976 the party Central Committee recommended that other republics, krais and oblasts utilize the experience of the Uzbek SSR, which was participating in the performance of grand-scale work in the Nonchernozem Zone.

Specifically, what kind of experience could we tell our colleagues about today? First of all, we could tell them about our methods of organizing this kind of construction, our methods of organization and administration. A special trust has been set up in each oblast of the Nonchernozem Zone where we are working. The trust has jurisdiction over mobile mechanized columns, and this is our main shock force. Each column has a sponsor. For example, one is sponsored by Tashkent, another by Andizhan, a third by Samarkand, and so forth. The sponsor supplies the column with personnel and equipment.

The Uzbek workers' participation in the transformation of the Nonchernozem Zone is one of the central concerns of the republic Communist Party Central Committee Bureau, Central Committee First Secretary Sh. R. Rashidov and the party, soviet and economic organs in all of our oblasts. We could also tell about our winter work practices. Uzbek reclamation workers have successfully employed methods which have allowed them to put the fields in good condition even in winter. Of course, we will also be happy to learn from our friends from other republics who are working in the Nonchernozem Zone.



[Question] Here is my last question, Yerezhep Aytmuratovich: As we have explained today, the reclamation and construction workers of Uzbekistan have much to do, both at home and elsewhere. Apparently, they had just as much work to do 7 years ago, when Uzbekistan offered to participate in carrying out the program for the development of the Nonchernozem Zone. It seems to me that this offer, this desire to take on additional responsibilities, was motivated primarily by political and moral considerations. Is this true?

[Answer] Yes, it is. We acted in accordance with the laws of friendship and fraternity among all Soviet peoples. We could not have acted in any other way.... Step up to the window and look at Tashkent, at these beautiful buildings and tree-lined streets, and tell me: When Tashkent was lying in ruins after an earthquake, who helped us lift it up and make it even more beautiful? It was the entire Soviet population, the entire nation. Look at those elegant boulevards. The buildings there were erected by people from Moscow, Leningrad, Minsk and Kiev.... And there, on Lenin Street, is the subway station. The Moscow subway construction workers helped us build our underground railway. When the Uzbek people were fighting anti-Soviet forces during the Civil War, who was fighting by our side, without a thought for their own lives? Russian Red Army soldiers, weavers from Ivanovo and workers from St. Petersburg. And who helped us elevate the Golodnaya Steppe? The entire nation, all of the republics. But the great Russian people helped most of all. And it was certainly our duty to tell the Russian people, when they were faced by the prospect of unprecedented work in the Nonchernozem Zone: Dear friends, we want to work with you. It was with your help that we became the largest and strongest center of reclamation and irrigation work in the nation, and everything is going well in the republic. Allow us to share our experience with you now. We will make every effort, working by your side, to turn your northern lands into highly productive lands and, in this way, repay at least part of the debt we owe you for the tremendous, selfless and fraternal assistance that you have been giving us for all these years.

Finally, this is not so much a matter of assistance as of something natural and necessary, not only to Russia but to all of us, to the entire family of fraternal republics. We are participating in a project which may be Russian, but it is of unionwide significance.

Here in Uzbekistan we have a construction method we call the khashar, in which all of us work together, all at once, like one family, with each person doing as much as possible for others. For us, the transformation of the Nonchernozem Zone is also a khashar.

This can only be done by extremely close friends, by the members of one friendly family.

What can I add: We are brothers. And this says it all....

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CSQ: 1800/620



## LABOR

### TAJIK KOMSOMOL MISLEADS WORKERS ON JOBS IN ROSTOV

Moscow KOMSOMOL'SKAYA PRAVDA in Russian 4 Aug 81 p 2

[Article by V. Merkulov, Rostov-na-Donu, Dushanbe: "Promises Await You"]

[Text] "Idlers" were on their way to a construction job. It is true that they will become idlers later. In the meantime they are ordinary lads with identity cards and labor books, and bearing Komsomol travel authorizations. They were on the long trip from Dushanbe to Rostov, to settle in that unfamiliar city. Glavsevkavstroy Construction Trust No 7 greeted the emissaries of the Tajik Komsomol with great fanfare. One can understand how pleased the welcoming committee was. The trust is building industrial enterprises, housing, and is renovating and building plants, including for the Ministry of Tractor and Agricultural Machine Building. Workers are worth their weight in gold to the trust.

And now new workers had arrived. In 1980 52 persons came to the trust on Komsomol travel authorizations. "All of them have become experts at their job and activist public-spirited citizens," we should like to report. Unfortunately, not more than about 10 of the lads from last year's assault force are still working at the enterprise. In February eight more Komsomol members were signed on with Construction Administration-106, but subsequently... all of them were fired for absenteeism. The city on the Don greeted the next detachment from Tajikistan in May. All but one have returned home.

"I cannot understand what the problem is," stated V. Tarasyan, deputy trust manager for personnel and employee services, shrugging his shoulders. "It would seem that we are creating all the necessary conditions, but... for some reason they don't want to work. Strange, but nevertheless true."

"I was not planning on working in your trust," retorted Gaibnazar Khakimov, attempting to justify his actions, not having worked a single day. "I had no idea. The Zheleznodorozhnyy Rayon Komsomol Committee in Dushanbe gave me a travel authorization which clearly stated: Rostsel'mash."

So that was it. Komsomol rayon committees, in an attempt to meet their quotas faster, sometimes make out Komsomol travel authorizations incorrectly, filling in the wrong employer. Komsomol officials in some rayons in this republic are also guilty of other things. With no grounds for doing so, they promise their fellow countrymen big money, although many of the volunteers have not yet learned a trade.

They are generous with such promises in Isfara, Leninabad, and Shurab. "They deceived us," states Tat'yana Khusnutdinova quite frankly. Umar Idrisov and Kurban Abdurakhimov set out from Rostov for Chita to "make money." Tat'yana Khusnutdinova also set out for parts unknown. They rested from the journey, looked around the city, and went elsewhere....

The fact is that very little is known about Trust No 7 in Tajikistan. The Komsomol rayon committees have no publicity materials on its activities other than the rotaprint terms of employment. Letters requesting personnel stream out of Rostov, but the Don construction people prefer to avoid personal contacts with the young people of this republic. When they were signing up the last detachment of volunteers in May, for example, they urgently requested that a representative of the trust travel to Dushanbe to take a look at the young people in advance and select those who were really needed. They received no answer to this request. Trust Komsomol committee secretary Lyudmila Dodel'tseva happened to see this request "by chance" after the young people had already arrived.

Do the boys and girls not seek to go to Rostsel'mash, which is located alongside the trust, because contacts between the plant and the republic Komsomol are closer? The result is that Komsomol members from our mountain region work out well there. Kasim Nasrullayev, Larisa Satyboldiyeva, Ravilya Zakirova, and Roza Dzheyentayeva have made a fine impression on the plant Komsomol committee. One of the best workers in the Rostsel'mash press shop is a young emissary from Tajikistan, Tat'yana Zakharova, who is now a member of the shop Komsomol committee. But in the trust office I was told time and again that the newcomers are not very hard-working, to put it mildly. Can it be that such different people come from the same republic? Perhaps the reason for the great difference in labor performance by persons from areas with surplus manpower is a difference in attitude toward these people.

"We arrived on a Saturday," related Karim Azizov from Leninabad. "There was nobody at the trust to take care of us. For three days we slept wherever we could. But that is only half of it. At home I was employed as a fourth-category machine operator. The trust assigned me a crane which was not in working order. No matter where I turned, everybody wanted to pass the buck, and at the production equipment administration they told me if I didn't like it I could quit. They say they really need workers. But they certainly don't act like it."

I learned that the young people were promised extremely high earnings not only back home but by the trust as well. In the terms of employment, which list the wage rates, there is not a single one below 170 rubles per month.

"I was told at the production equipment administration where they sent me," stated Rafael' Karimov from Dushanbe, "that I would earn not less than 160 rubles. And yet my very first pay was barely more than one third as much."

I jotted down Rafael's last name and headed for the administration's Komsomol bureau.

"You have a Karimov working here," I addressed deputy secretary Lyubov' Andrushkina. "Is he a Komsomol member?" "He is," she replied, "but I don't have his card."

"Where is it?"

"Search me. I have only seen him on one occasion."

Indifference toward an individual Komsomol member engenders in the latter a response: indifference -- toward his job. B. Belikov, chief of Construction Administration-304, unwittingly confirmed this. I went to his office to find out how the young Tajiks in his administration are doing.

"You are misinformed. I don't have a single one," he stated. "There was one here, to be true, by the name of Sokhibov. Quite a disturbing influence in the administration, constantly yakking...."

Khasan Sokhibov was one of the few who was still working in the trust. Another supervisor, V. Reprintsev, one of the trust's best carpenter-concrete worker brigade leaders, from whom Khasan ultimately requested a job, had to say about him: "He sticks to every job he is given, both carpentry and concrete work. If he continues this way, he will become a fine worker. Sure he likes to talk. So what? He is a very straightforward person. He tells us a lot about his Pyandzh, about Tajikistan."

One realizes from a conversation with Reprintsev that it is not so much that these young people are not capable (after all, they came to this construction project voluntarily, at their own desire) as that the conditions for smoothly incorporating these young people into a large work force still leave much to be desired.

Tajikistan Komsomol has sent 70 persons to Trust No 7. Only a handful were unable to take tough physical labor. Only a few decided simply to "split," to move on and drift about. The remainder were deceived by promises. Now these young people, after traveling to Rostov, are returning home, singly and in groups. This is a defeat for all interested parties. Not only a financial but a moral defeat as well.

3024

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# LABOR

## TIME BUDGET STATISTICS IN USSR

Moscow VESTNIK STATISTIKI in Russian No 6, Jun 81 p 79

[Text]

111. TIME BUDGET OF WORKERS, EMPLOYEES AND KOLKHOZ WORKERS IN MARCH 1980 (Based on selected surveys of 51,600 families that keep family budget records) 1. Daily Available Time for Industry Laborers and Office Workers and Kolkhoz Workers During Work and Off Days (on the average for one worker--in hours and minutes)				
	Industry laborers and office workers		Kolkhoz workers	
	Work Day	Off Day	Work Day	Off Day
Daily Available Time.....	24.00	24.00	24.00	24.00
That which is:				
Work time.....	7.53	--	7.37	--
Time associated with work (travel to and from place of work, lunch time and shift changes)....	1.39	--	0.58	--
Time for doing housework.....	2.31	5.22	2.08	4.13
To purchase wares and obtain services.....	0.41	1.34	0.21	0.48
To work on the house.....	1.50	3.48	1.47	3.27
Time spent on private subsidiary farm or a garden plot.....	0.03	0.08	1.17	1.51
Free time.....	3.10	7.51	2.37	6.33
For rest and relaxation.....	2.43	7.14	2.22	6.07
Time for satisfying physical needs (sleep, taking meals, caring for oneself).....	8.40	10.16	9.12	10.37
Other time spent.....	0.04	0.23	0.11	0.46



## 2. Structure of Daily Available Time for Industry Laborers and Office Workers and Kolkhoz Workers

(on the average for one worker--in percent)

	Industry laborers and office workers		Kolkhoz workers	
	Work Day	Off Day	Work Day	Off Day
Daily Available Time.....	100	100	100	100
That which is:				
Work time.....	32.8	--	31.7	--
Time associated with work (travel to and from place of work, lunch time and shift changes)....	6.9	--	4.0	--
Time for doing housework.....	10.3	22.4	8.9	17.6
To purchase wares and obtain services.....	2.9	6.5	1.5	3.3
To work on the house.....	7.6	15.9	7.4	14.3
Time spent on private subsidiary farm or a garden plot.....	0.2	0.6	3.3	7.7
Free time.....	13.2	32.7	10.9	27.3
For rest and relaxation.....	11.3	30.1	9.9	23.5
Time for satisfying physical needs (sleep, taking meals, caring for oneself).....	36.1	42.8	38.3	44.2
Other time spent.....	0.3	1.5	0.9	3.2

The survey was conducted by a special questionnaire with such considerations so that families with varying numbers of people (single people, families with 2, 3, 4 and more people) would be polled proportionally. The working members of the family 16 years and older kept detailed records of all the time they spent according to the order in which it was done during those days for which the poll was conducted; other members of the family 12 years and older kept records only for time spent on doing housework, buying wares, obtaining services and working on a private farm. The value of work time was obtained by beginning with a five-day work week.

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## EDUCATION

### EDUCATION STATISTICS IN USSR

Moscow VESTNIK STATISTIKI in Russian No 7, Jul 81 pp 69-79

[Text]

II. EDUCATION IN THE USSR		
1. Number of Students Encompassing All Types of Education by Union Republics (at the beginning of the academic year; thousands of people)		
	1975/76	1980/81
USSR.....	92,605	100,201
RSFSR.....	49,574	52,437
Ukrainian SSR.....	16,983	18,429
Belorussian SSR.....	3,391	3,627
Uzbek SSR.....	3,217	3,930
Kazakh SSR.....	3,492	6,262
Georgian SSR.....	1,410	1,487
Azerbaijan SSR.....	2,158	2,361
Lithuanian SSR.....	1,162	1,248
Moldavian SSR.....	1,483	1,665
Latvian SSR.....	820	898
Kirghiz SSR.....	1,259	1,492
Tajik SSR.....	1,241	1,481
Armenian SSR.....	1,072	1,211
Turkmen SSR.....	867	1,042
Estonian SSR.....	475	611

2. Students Graduated from General Education Schools by Union Republics  
(thousands of people)

	Completed Eight-Year School		Completed High School	
	1975	1980	1975	1980
USSR.....	5,201	4,270	3,564	3,966
RSFSR.....	2,628	1,982	1,717	1,882
Ukrainian SSR.....	880	709	692	729
Belorussian SSR.....	193	157	151	147
Uzbek SSR.....	363	374	272	310
Kazakh SSR.....	354	312	222	272
Georgian SSR.....	105	94	75	86
Azerbaijan SSR.....	161	163	103	130
Lithuanian SSR.....	64	56	36	55
Moldavian SSR.....	85	66	59	63
Latvian SSR.....	36	32	21	25
Kirghiz SSR.....	84	81	58	71
Tajik SSR.....	89	95	56	76
Armenian SSR.....	75	63	47	52
Turkmen SSR.....	63	67	43	53
Estonian SSR.....	21	19	12	15

3. Mid-Level Specialised Educational Institutions by Sector Groups of Educational Institutions and by Union Republics at the Beginning of the 1980/81 Academic Year									
	Total Mid-level Specialised Educational Institutions	Education institutions that are in:							Art and Cinematography
		Industry and Construction	Transportation and Communications	Agriculture	Economics and Law	Health care, Physical Fitness and Sports	Education		
USSR.....	4,383	1,476	252	683	386	654	576	356	
RSFSR.....	2,505	929	150	315	188	390	350	183	
Ukrainian SSR.....	727	243	48	106	103	107	72	48	
Belorussian SSR.....	335	41	7	30	8	19	17	13	
Uzbek SSR.....	222	59	8	52	24	27	36	16	
Kazakh SSR.....	236	60	15	49	20	31	40	21	
Georgian SSR.....	91	21	3	23	6	14	6	18	
Azerbaijan SSR.....	75	19	3	18	4	12	9	10	
Lithuanian SSR.....	70	18	2	25	5	6	7	7	
Moldavian SSR.....	51	13	2	12	5	8	7	4	
Latvian SSR.....	55	8	5	17	3	9	2	11	
Kirghiz SSR.....	41	9	1	6	4	9	7	5	
Tajik SSR.....	38	11	—	3	5	7	9	3	
Armenian SSR.....	65	29	4	9	4	7	4	8	
Turkmen SSR.....	35	8	2	6	3	5	6	5	
Estonian SSR.....	37	8	2	12	4	3	4	4	



4. Higher Educational Institutions by Sector Groups of Educational Institutions and by Union Republics at the Beginning of the 1980/81 Academic Year									
	Total Mid-level Specialized Educational Institutions	Education Institutions that are in:							Art and Cinematography
		Industry and Construction	Transportation and Communications	Agriculture	Economics and Law	Health care, Physical Fitness and Sports	Education		
USSR.....	683	228	46	103	57	104	287	58	
KFSR.....	494	149	29	57	32	54	147	26	
Ukrainian SSR.....	147	40	10	17	11	18	42	9	
Belorussian SSR.....	32	8	1	4	3	4	10	2	
Uzbek SSR.....	43	5	3	4	3	6	20	2	
Kazakh SSR.....	55	12	2	7	3	6	23	2	
Georgian SSR.....	19	2	--	3	--	2	9	3	
Azerbaijan SSR.....	17	3	--	1	2	2	7	3	
Lithuanian SSR.....	12	2	--	2	1	2	3	2	
Moldavian SSR.....	8	1	--	1	--	1	4	1	
Latvian SSR.....	10	1	1	1	--	2	3	2	
Kirghiz SSR.....	10	1	--	1	--	2	5	1	
Tajik SSR.....	10	1	--	1	--	2	5	1	
Armenian SSR.....	13	1	--	2	1	2	5	2	
Turkmen SSR.....	7	1	--	1	1	1	2	1	
Estonian SSR.....	6	1	--	1	--	--	2	2	

5. Number of Students in Higher Education Institutions by Groups of Specialties and by Union Republics at the Beginning of the 1980/81 Academic Year (persons)																
	USSR	RSFSR	Ukrainian SSR	Belorussian SSR	Uzbek SSR	Kazakh SSR	Georgian SSR	Azerbaijan SSR	Lithuanian SSR	Moldavian SSR	Latvian SSR	Kirghiz SSR	Tajik SSR	Armenian SSR	Turkmen SSR	Estonian SSR
TOTAL.....	5,235,193	3,043,761	880,399	177,016	278,063	259,973	85,783	107,024	70,995	51,340	47,230	55,406	56,762	58,136	35,831	25,472
Those that are the following groups of specialties:																
Geology and prospecting for mineral deposits.....	38,800	24,648	5,296	349	1,953	2,758	843	1,370	151	--	--	362	222	271	506	71
Developing mineral deposits.....	57,719	34,908	11,728	325	1,736	4,635	1,157	1,674	--	--	--	241	--	406	783	126
Energetics.....	122,315	73,997	20,451	3,322	4,814	6,950	1,801	3,193	1,215	936	1,069	1,406	443	1,539	558	619
Metallurgy.....	59,252	40,845	12,933	886	233	2,391	1,047	467	--	--	--	--	--	350	--	--
Machine and instrument building.....	605,612	409,067	111,814	17,759	14,899	15,514	6,518	9,287	5,612	1,760	2,535	2,607	922	5,332	741	1,245
Chemical technology.....	95,420	65,699	16,042	1,808	2,626	2,843	1,860	2,063	369	--	608	--	--	838	435	229
Forestry engineering, wood, cellulose and paper technology.....	36,775	28,165	4,688	2,147	338	--	424	171	262	--	405	--	--	--	--	195
Food production technology.....	85,089	50,552	18,908	2,543	2,924	3,404	1,120	1,157	734	1,168	830	789	--	468	--	491
Consumer goods technology.....	65,557	39,502	10,815	2,088	5,193	2,148	1,312	1,472	1,318	--	597	--	--	1,024	--	88
Construction.....	430,167	240,732	72,032	17,335	23,956	29,378	8,447	7,263	5,717	3,915	3,759	5,470	2,957	5,073	2,361	1,772
Geodesy and cartography.....	12,752	8,491	2,758	231	345	455	69	164	239	--	--	--	--	--	--	--
Hydrology and meteorology.....	8,276	5,482	2,250	--	243	225	76	--	--	--	--	--	--	--	--	--
Agriculture and forestry.....	456,226	241,932	72,935	22,808	28,000	32,545	8,838	6,502	7,787	7,787	4,611	4,494	5,150	4,599	5,018	3,220
Transportation.....	173,732	108,907	33,868	5,406	6,497	9,019	1,860	1,851	862	595	2,035	1,604	544	121	126	417
Economics.....	638,099	373,525	115,470	24,194	28,663	26,692	8,033	11,361	10,828	7,216	7,526	5,756	5,498	5,065	3,811	4,463
Law.....	101,643	65,180	12,707	2,319	5,061	4,658	1,244	1,375	1,419	1,059	1,279	819	1,304	925	1,377	847
Health care and physical fitness.....	377,176	208,080	60,749	11,960	26,713	22,880	7,043	8,413	4,564	5,109	3,224	5,038	4,689	3,445	3,232	2,037
Universities.....	386,412	195,947	69,189	17,547	26,720	11,901	8,852	10,085	6,721	4,232	5,770	7,367	5,921	5,318	7,592	3,250
Pedagogical institutes and cultural colleges specialties.....	923,483	461,706	122,952	30,037	83,867	72,659	16,764	29,772	15,342	14,869	5,540	17,016	27,605	13,301	8,929	3,124
Art.....	42,979	20,892	7,157	1,632	2,325	1,424	1,756	1,291	1,572	470	942	522	623	1,183	244	945

6. Specialists Graduated from Higher Educational Institutions by Groups of Specialties and by Union Republics in 1980 (persons)																
	USSR	RSFSR	Ukrain- ian SSR	Belor- ussian SSR	Uzbek SSR	Kazakh SSR	Geor- gian SSR	Azer- baijan SSR	Lith- uanian SSR	Mol- davian SSR	Latvian SSR	Kirghiz SSR	Tajik SSR	Armen- ian SSR	Turkmen- ian SSR	Eston- ian SSR
TOTAL.....	817,260	459,628	148,092	30,705	44,260	38,616	14,705	18,068	10,400	8,273	6,903	8,483	1,160	10,702	5,610	3,655
Those that are the following groups of specialties:																
Geology and prospecting for mineral deposits.....	6,152	3,829	920	68	315	397	125	183	31	--	--	59	53	57	103	12
Developing mineral deposits.....	8,728	5,273	2,055	59	211	577	132	209	--	--	--	25	--	74	108	5
Energetics.....	17,719	10,252	3,436	659	596	1,028	233	410	163	130	111	179	88	267	71	96
Metallurgy.....	8,651	5,792	2,083	115	39	330	160	63	--	--	--	--	--	69	--	--
Machine and instrument building.....	86,649	56,397	17,261	2,596	2,001	1,808	768	1,048	746	249	323	344	79	833	67	167
Chemical technology.....	14,684	10,144	2,538	315	355	338	253	293	57	--	127	--	--	155	50	59
Forestry engineering, wood, cellulose and paper technology.....	5,652	4,358	672	424	--	--	68	41	51	--	38	--	--	--	--	--
Food production technology.....	12,215	7,046	2,969	359	400	494	180	86	90	184	82	134	--	122	--	69
Consumer goods technology.....	8,949	4,968	1,688	354	794	300	236	194	192	--	89	--	--	134	--	--
Construction.....	61,289	32,665	11,620	2,740	3,582	3,714	1,251	1,041	822	559	477	764	461	1,051	305	217
Geodesy and cartography.....	1,975	1,303	447	49	49	55	--	38	34	--	--	--	--	--	--	--
Hydrology and meteorology.....	1,267	828	363	--	23	38	15	--	--	--	--	--	--	--	--	--
Agriculture and forestry.....	64,458	33,547	11,003	3,654	4,033	4,318	1,305	935	881	1,142	571	594	636	678	726	435
Transportation.....	22,020	13,321	4,756	715	815	914	248	292	125	87	328	247	78	26	23	45
Economics.....	108,230	60,978	21,622	4,543	4,917	4,507	1,458	2,095	1,687	1,062	1,183	998	887	1,033	656	604
Law.....	16,287	10,238	2,369	361	705	634	225	224	230	211	203	137	208	195	232	115
Health care and physical fitness.....	59,596	32,711	9,967	1,961	3,968	3,599	1,151	1,429	869	702	493	756	705	535	430	320
Universities.....	64,076	31,843	12,335	3,053	4,005	1,852	1,785	1,701	962	732	840	1,141	929	1,059	1,288	551
Pedagogical institutes and cultural colleges specialties.....	167,817	80,499	23,527	6,424	15,528	12,771	3,871	6,596	2,375	2,859	926	2,789	4,778	2,842	1,512	520
Art.....	7,503	3,679	1,308	341	329	181	281	276	244	114	155	71	104	218	39	163

7. Number of Students in Mid-Level Specialized Educational Institutions by Groups of Specialties and by Union Republics at the Beginning of the 1980/81 Academic Year (persons)																
	USSR	RSFSR	Ukrain- ian SSR	Belor- ussian SSR	Uzbek SSR	Kazakh SSR	Geor- gian SSR	Azer- baijan SSR	Lith- uanian SSR	Mol- davian SSR	Latvian SSR	Kirghiz SSR	Tajik SSR	Armen- ian SSR	Turkmen SSR	Eston- ian SSR
TOTAL.....	4,611,671	2,641,564	803,097	162,769	237,636	265,452	53,385	79,000	68,357	58,878	42,207	49,446	40,149	51,774	34,037	23,900
Those that are the following groups of specialties:																
Geology and prospecting for mineral deposits.....	22,053	13,758	3,368	—	1,256	2,140	—	677	66	—	—	—	611	177	—	—
Developing mineral deposits.....	49,358	22,604	16,672	881	1,120	4,402	623	1,300	102	—	—	168	118	235	922	241
Energetics.....	190,824	110,147	42,595	4,394	6,930	10,823	1,738	3,658	2,373	1,129	731	802	1,208	1,700	1,661	935
Metallurgy.....	54,363	33,167	15,873	1,105	921	1,471	468	902	—	—	—	223	30	203	—	—
Machine and instrument building.....	560,487	373,016	103,145	16,145	16,551	12,755	4,042	8,066	6,543	3,220	2,998	3,506	1,840	6,090	1,396	1,174
Electrical machine and instrument building.....	149,819	94,596	30,711	3,637	4,963	2,914	907	1,787	1,474	1,201	1,286	780	405	4,484	226	448
Chemical technology.....	75,465	44,405	16,575	3,140	2,113	2,528	808	3,114	902	229	216	—	176	2,410	550	296
Forestry engineering, wood, cellulose and paper technology.....	44,562	32,198	5,308	2,095	1,080	1,021	681	418	552	—	404	84	201	79	—	441
Food production technology.....	169,150	90,049	37,637	4,973	7,730	9,166	2,065	2,847	2,143	3,037	2,075	2,120	1,336	1,684	775	1,513
Consumer goods technology.....	113,620	62,662	16,797	5,183	9,185	4,634	1,605	3,225	1,904	2,179	986	1,659	1,848	2,343	716	694
Construction.....	399,175	219,901	64,187	15,647	26,030	30,183	5,450	7,237	5,655	5,355	4,002	4,905	3,580	5,363	2,264	1,416
Geodesy and cartography.....	14,409	7,449	2,408	411	1,363	870	668	380	167	—	—	110	282	91	154	56
Hydrology and meteorology.....	6,199	4,527	781	—	800	—	91	—	—	—	—	—	—	—	—	—
Agriculture.....	667,596	346,717	103,127	37,779	34,610	57,339	9,582	9,393	19,537	11,200	7,116	8,931	6,590	4,419	5,882	5,376
Transportation.....	298,823	178,132	53,257	7,488	10,941	16,347	3,659	5,818	4,337	1,569	6,784	1,604	605	2,455	2,748	3,079
Economics.....	632,327	357,304	119,816	21,341	33,436	34,622	9,270	8,800	8,698	8,178	5,894	6,290	5,643	5,340	4,621	3,072
Law.....	7,123	3,507	1,231	149	954	720	234	118	62	—	—	—	58	30	—	60
Health care and physical fitness.....	452,318	260,680	65,564	13,909	25,560	30,299	4,107	7,578	4,927	8,002	4,108	7,317	6,991	6,234	4,633	1,629
Education.....	433,327	231,057	65,851	12,256	42,385	31,568	2,581	7,610	3,838	8,724	2,154	7,755	6,801	2,976	5,923	1,848
Art.....	126,233	66,112	18,253	5,677	6,581	7,730	3,379	3,680	2,565	1,964	2,211	2,081	1,365	2,827	983	825



B. Specialists Graduated from Mid Level Specialized Educational Institutions by Groups of Specialization and by Union Republics in 1980 (persons)															
	USSR	RTSR	Armenian SSR	Belorussian SSR	Georgian SSR	Kazakh SSR	Ukrainian SSR	Latvian SSR	Lithuanian SSR	Moldavian SSR	Latvian SSR	Lithuanian SSR	Ukrainian SSR	Armenian SSR	Belorussian SSR
TOTAL	1,274,700	220,701	232,276	67,404	43,021	20,202	16,283	72,650	10,295	16,974	10,817	12,129	10,957	16,153	8,657
Those that are the following groups of specialization:															
mineral resources and prospecting for mineral deposits	5,365	3,717	493	--	286	561	--	143	21	--	--	--	147	20	--
developing mineral deposits	10,090	5,015	3,785	240	273	812	113	286	21	--	--	18	32	72	155
metallurgy	44,691	25,990	10,047	1,305	1,523	2,471	522	861	567	255	151	112	270	329	861
machinery and instrument building	137,127	88,991	34,129	3,640	3,286	2,716	1,001	1,786	1,457	753	561	934	632	1,744	802
electrical machine and instrument building	36,759	23,216	7,892	939	819	571	153	383	381	308	462	153	98	1,282	32
chemical technology	18,513	11,617	3,465	740	319	647	286	659	199	29	68	--	30	695	101
forest engineering, wood, cellulose and paper technology	11,811	8,916	1,349	641	260	291	193	112	167	--	65	27	49	--	61
food production technology	64,220	23,429	10,762	1,758	1,697	1,967	452	713	676	821	573	453	319	634	192
consumer goods technology	27,641	15,092	3,221	1,336	1,071	1,031	369	779	602	400	214	335	305	722	143
construction	102,913	56,644	18,757	4,434	3,722	2,376	1,687	2,086	1,549	1,557	856	1,061	864	1,530	475
cosmology and cartography	1,640	1,966	401	96	316	235	168	98	42	--	--	20	38	31	27
hydrology and meteorology	1,702	1,223	250	--	202	--	27	--	--	--	--	--	--	--	--
agriculture	165,542	79,191	29,989	10,277	8,853	14,086	2,819	2,879	4,789	3,658	1,493	1,973	1,584	1,312	1,704
transportation	77,631	42,791	14,040	2,077	2,775	3,536	864	1,485	992	351	1,488	334	179	571	606
telecommunications	242,668	111,505	49,817	8,690	12,826	11,102	4,084	3,794	3,446	3,436	2,180	2,340	2,087	2,324	1,821
medicine	2,558	1,313	473	29	435	297	105	54	--	--	--	--	--	--	--
health care and physical fitness	156,188	90,213	21,215	4,672	10,331	10,577	1,790	3,069	1,930	2,626	1,279	2,592	2,380	2,223	1,193
education	119,581	67,316	18,947	3,533	9,293	7,516	910	2,214	1,431	1,402	756	1,606	1,775	1,089	1,775
art	27,326	14,137	4,209	1,460	1,154	1,374	856	868	313	563	505	380	235	722	169

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## DEMOGRAPHY

### GAUGING AND ANALYZING DEMOGRAPHIC PROCESSES

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[Article by A. Volkov: "Measurement and Analysis of Demographic Processes. Demographic Coefficients" a continuation of the publication of articles of demographic statistics, see VESTNIK STATISTIKI, 1980, Nos 4, 7, 11]

[Text] The dependency of demographic coefficients on the composition of the population. There is a clear interconnection among general, special and particular demographic coefficients. The overall coefficient of the birthrate ( $n$ ), for example, is equal to the product of the special coefficient of birthrate ( $f$ ) multiplied by the proportion of women 15-49 years of age in the population:

(1)

$$n = \frac{N}{S} = \frac{N}{F} \cdot \frac{F}{S} = f \cdot d,$$

where  $N$ --the overall number of births;

$F$ --the number of women 15-49 years of age;

$S$ --the number of population;

$d = \frac{F}{S}$ --the proportion of women 15-49 years of age in the population.

Table 1 gives the basic characteristics of the birthrate for two years--1965 and 1975 (standardized data). The number of women 15-49 years of age and the number of all adults during these years are given in the last line of the table. The overall number of population in the middle of the year 1965 was 31,496,000 and in 1975--34,022,000.

The special coefficient of the birthrate in 1965 and 1975 was, consequently, equal to

$$f^0 = \frac{546\,000}{7\,630\,000} = 0,0716 \text{ or } 71,6\text{‰};$$

$$f^1 = \frac{644\,000}{9\,030\,000} = 0,0713 \text{ or } 71,3\text{‰}.$$

and the proportion of women 15-49 years of age in the population

$$d^0 = \frac{7631000}{31496000} = 0.242; \quad d^1 = \frac{9000000}{34022000} = 0.265.$$

The overall coefficient of the birthrate in 1965 amounted to

$$\pi^0 = f^0 \cdot d^0 = 71.6\% \cdot 0.242 = 17.3\%;$$

and similarly for 1975

$$\pi^1 = f^1 \cdot d^1 = 71.3\% \cdot 0.265 = 18.9\%.$$

By giving the overall coefficient in this way it is possible to clarify how each of the cofactors influences the results. This is done as follows:

For 1965 the proportion of women 15-49 years of age in the population is  $d^0=0.242$ . If it had not changed from 1965 through 1975 and only the special coefficient of the birthrate had changed, the overall coefficient of the birthrate in 1975 would have been  $n=f^1 \times d^0 = 71.3\% \times 0.242 = 17.3\%$ , that is it would practically not have changed.

But for 1965 the special coefficient of the birthrate  $s^0=71.6\%$ . If it had not changed during the ten years and only the proportion of women 15-49 years of age in the population had changed, the overall coefficient of the birthrate in 1975 would have been  $n=s^0 \times d^1 = 71.6\% \times 0.265 = 19.0\%$ , that is, it would have been little more than the actual level (18.9%). The comparison of these two conventional results makes it possible to conclude that the increase of the overall coefficient of the birthrate was brought about mainly by an increase in the proportion of women of childbearing age in the population. A certain reduction of the special coefficient of the birthrate (from 71.6% to 71.3%) somewhat slowed the influence of this increase.

Further, the overall number of births in 1975 (640,000) can be presented as the sum of the products of the age coefficients of the birthrate (column 7, Table 1) and the number of women of the corresponding age (column 2), that is,  $644,000 = 32 \times 1676 + 170 \times 1683 + \dots + 1 \times 1137$ .

Hence it is clear that the overall number of births this year will depend not only on the level of the birthrate at each stage as it is characterized by age coefficients, but also on the age composition of women of childbearing age. There will be more births when there are more women of those ages at which the birthrate level is higher and when the birthrate coefficients are higher, and vice versa.

The age composition itself is the result of changes in demographic processes in the past. Attention is drawn to the number of women in the age group of 20-24 years in 1965. There are almost one-third less of them than in the preceding age group (985,000 as against 1,421,000). The reason is clear: in 1965 women in the 20-24 year age group were born in 1940-1945 when the level of the birthrate declined and the absolute and relative number of births was less. They gave birth to fewer children (100,000 less than did women of the same age in 1975), although the level

Table 1. Basic Characteristics of Birth Rate (conventional figures)

(1) Возраст- ные группы женщин	(2) Число женщин данного возраста на середину года (в тыс.)		(3) У женщин данного возраста родилось детей за год (в тыс.)		(4) Возрастные коэф- фициенты рождаемо- сти (число рождений на 1000 женщин данного возраста)		(5) для 1975 г.	
							относ- ительные числа рожде- ний в интер- вале возрас- та на 1000 женщин (гр. 7 x 5) (6)	накоп- ленные относ- ительные числа рожде- ний к концу возраст- ного ин- тервала (7)
	1966 г.	1975 г.	1966 г.	1975 г.	1966 г.	1975 г.		
1	2	3	4	5	6	7	8	9
15-19	1 421	1 676	45	53	32	32	160	160
20-24	958	1 683	176	286	184	170	850	1 010
25-29	1 105	1 385	158	189	144	136	680	1 690
30-34	1 170	943	96	67	84	71	355	2 045
35-39	1 192	1 077	52	37	43	34	170	2 215
40-44	1 079	1 129	16	11	15	10	50	2 265
45-49	706	1 137	1	1	2	1	5	2 270
15-49	7 631	9 030	346	644	71,6	71,3	2 270	

Key:

1. Age groups of women
2. Number of women of a given age in the middle of the year (thousands)
3. Children born of women of a given age during the year (thousands)
4. Age coefficients of the birth rate (number of births per 1,000 women of a given age)
5. For 1975
6. Relative numbers of births in the age interval per 1,000 women (gr. 7 x 5)
7. Accumulated relative number of births by the end of the age interval.

of the birthrate was higher at these ages. In 1975 this was the situation in the 30-34 age group, and again there were relatively fewer children on earth (but now it is no longer because of the small number of mothers, but because of a low birth-rate). This is a clear illustration that past fluctuation in the intensiveness of demographic processes affect through the age structure the number of events and the level of demographic coefficients at the present time.

Taking this dependency into account, one can present the special coefficient of the birthrate in the form

$$f = \sum_{x=15}^{x=49} \frac{N_x}{P_x} \cdot \frac{F_x}{P} = \sum_{x=15}^{x=49} f_x \cdot h_x. \quad (2)$$



where  $x$ —age,  $N_x/F_x$  —  $f_x$ —age coefficients of birthrates, and  $F_x/F = h_x$ —proportions of women at age  $x$  in the overall number of women in the age 15-49 years of age. The total includes the age interval of 15-49 years.

Now one can determine how the change in the age structure affected the level of the special coefficient of the birthrate. To do this it is necessary to calculate its value for 1975, with the same values of  $h_x$ , as in 1965:

$$f = \frac{1}{7631000} (32 \cdot 1421 + 170 \cdot 958 + 136 \cdot 1105 + \dots + 1 \cdot 706) = \\ = \frac{494900}{7631000} = 0,0647 = 64,7\%$$

This means that if the age structure had not changed, the special coefficient of the birthrate would have been  $100\% - \frac{64,7}{71,3} \times 100 = 100\% - 90,7\% = 9,3\%$  less than the actual (71.3%).

The change in the age structure of women of childbearing age can be attributed to increasing the coefficient mainly because a generation with more women entered the maximum childbearing age group.

The device that was just used is called standardization of coefficients, and it is widely used in demographo-statistical research. Let us consider it in somewhat greater detail.

Standardization of demographic coefficients. In principle any general or specific demographic coefficient can be regarded as an average of particular coefficients weighted in terms of the proportions of their parts (not necessarily age groups) in the population. When comparing indicators for various territories or for various periods, it is always necessary to keep in mind that they can differ not only because of various levels of intensiveness of the process itself in the various groups, but also as a result of the fact that the structure of the population differs in various territories and in various compared periods. In order to compare the actual intensiveness of the process, it is necessary to eliminate the influence of differences in the composition of the population on the overall or special coefficients. But sometimes the corresponding data are not available for one of the periods or regions and it is sometimes necessary to compare not particular, but consolidated generalized indicators.

The device of standardization of indicators, that is, reducing them to a single standard which eliminates differences in the composition of the population, is also used for these comparisons in demographic statistics.

Let us clarify methods of standardization with one more simple example (see Table 2).

As one can see from the table, the overall coefficient of the birthrate increased during the 50 years by  $(1-0.387) \times 100 = 61.3\%$ . But it is an average of the coefficients of the birthrate of urban and rural populations weighted in terms of the proportions of urban and rural population in its overall amount:

$$n = \frac{n_{urb} \times p_{urb} + n_{rur} \times p_{rur}}{p_{urb} + p_{rur}}$$

During these years there were changes not only in the coefficients for the city and the country, but also in the percentage of the urban population. Therefore, strictly speaking, the indicators for the population in 1913 and 1973 are not comparable.

Table 2. Coefficients of Birth Rate and Structure of USSR Population (1913, 1973)

Year	Coefficients of birth rate, ‰			Proportion in entire population	
	General	Particular		Urban population	Rural population
		Urban population	Rural population		
1913	45.5	30.2	30.2	0.18	0.82
1973	17.6	17.6	16.7	0.58	0.42

1973

compared

to 1913    0.387            0.553            0.385            —            —

For comparison, it is necessary to standardize them. The essence of this device consists in that a certain part of the population for which there are analogous data is taken as the standard, and then a certain index is found for each of the compared populations which reflects the ratio between the birth rate (or other process) in this population and that in the standard, and after that, by multiplying the general indicator for the standard by the index that has been found, one obtains the general standardized indicator for the given population, which is compared with analogous indicators for the populations of other territories.

Usually when two populations are compared, what is used as the standard is some third population or the average of the indicators for the populations of the two compared territories. If one compares, say, the indicators for the oblasts of a union republic, one can take for a standard the indicators for the republic as a whole. Here, because of the simplicity of the example, the indicators for 1913 were taken as a standard.

Most frequently the following three methods of standardization are used.

With the first method, the so-called direct standardization, the overall coefficient for 1973 is calculated simply with the same structure of the population as in 1913. The index of standardization will then be:\*

$$\frac{16.7 \cdot 0.18 + 16.8 \cdot 0.82}{45.5} = \frac{18.4}{45.5} = 0.404.$$

\* Note that in the numerator there is no need to divide by the sum of the weights when weighing since the sum of the weights is equal to 1. For economy's sake, the position of the unit of measurement is indicated only in the final result.

and the standardized coefficient of the birth rate

$$\pi_{\text{stan}} = 45,5 \cdot 0,404 = 18,4\%$$

Here the index is the ratio between the 1973 birth rate with the 1913 structure and the 1913 birth rate.

With the second method, the so-called indirect standardization, the indexes of standardization is calculated as the ratio between the coefficient for 1973 and the coefficient of the standard (that is, 1913), but weighted in terms of the 1973 structure.

$$\frac{17,6}{30,2 \cdot 0,58 + 48,8 \cdot 0,42} = \frac{17,6}{38,0} = 0,463.$$

The standardized coefficient of the birth rate will be:

$$\pi''_{\text{stan}} = 45,5 \cdot 0,463 = 21,1\%$$

Here the index is the ratio between the coefficients of the birth rate in 1973 and 1913, but with the population structure of 1973.

The third method--the so-called method of expected population numbers, is based on the fact that if  $n = \frac{N}{S}$ , then  $S = \frac{N}{n}$ . Here the index of standardization is no longer a ratio between coefficients, but a ratio between numbers of population. The amounts are

$$\frac{\frac{2\,450\,000}{30,2\%} + \frac{1\,936\,000}{48,8\%}}{249\,802\,000} = \frac{120\,798}{249\,802\,000} = 0,484.$$

2,450,000 and 1,936,000 are the numbers of births in 1973 among the urban and rural population, respectively, and the two fractions in the numerator signify those numbers of urban and rural population which, under the birth rate conditions of 1913, would have produced the actual number of births in 1973. The entire fraction indicates the ratio between this "expected" (120,978,000) and the actual (249,802,000) numbers of population. The standardized coefficient of the birth rate will be

$$\pi'''_{\text{stan}} = 45,5 \cdot 0,484 = 22,0\%$$

Somewhat different results were obtained with the three methods of standardization we have considered: in the first case the overall coefficient of the birth rate decreased by 59.6%, in the second case--by 53.6%, and in the third case--by 51.6%. Without standardization it decreased by 61.3%. Thus when comparing unstandardized indicators the degree of decrease in the coefficient of the birth rate increased since the effects of the changes in the distribution of the population into urban and rural were not excluded.

Standardization in terms of age is especially important since, as was already shown, the overall and special coefficients depend strongly on the age composition of the population.

Standardization is necessary for comparing indicators not only in time, as with our example, but also in space, that is, among territories. Usually in comparisons with standardization one uses indicators not for two, but for several populations, say, for the population of each of the rayons of the oblast, and the number of groups is also more than two.

The selection of the method of standardization depends on the available data. The direct method of standardization is used if one knows the particular coefficients for the compared populations and the composition of the standard. The indirect method is used if one knows the composition of each of the compared populations and the particular coefficients of the standard, the method of expected population numbers is used if one knows the particular coefficients of the standards, the particular numbers of the events in the compared populations and the overall numbers of these populations. In all three cases one must also know the overall coefficient for the standard.

Despite the apparent complexity, the most promising is the method of expected population numbers. It is the only one that can be used when one knows only the overall number of the given population and the number of events in its various parts, and the coefficients for each part cannot be calculated, but they are known for the standard. In particular, this method is suitable for comparing coefficients that are calculated on the basis of census data and for years after the census when there is no denominator for calculating the particular coefficients, but a current account gives the number of events for the various groups.

For example, for any year after the 1979 census, say, 1982, let there be data on the number of births of women of a certain age group for each level of education of women. One also knows the overall number of women of the given age in 1982, but it is not known how they are distributed in terms of levels of education, so that it is impossible to calculate the age coefficients of the birth rate in terms of the level of education. But if these coefficients exist for past years, particularly for 1979, which were obtained from data of the current account and the census, it is possible to calculate for the given age the coefficient of the birth rate, standardized by the method of the expected population numbers. In this case the formula of the coefficient will have the form:

$$n_{\text{stan}}^{1982} = n^{1979} \cdot \frac{\sum_i \frac{N_i^{1982}}{n_i^{1979}}}{S^{1982}} \quad (3)$$

where  $n^{1979}$  --the coefficient of the birth rate for the given age group for 1979 (for simplicity, the designation of the age is omitted everywhere);  
 $N_i^{1982}$  --the number of births in 1982 by mothers of the given age with  $i$  level of education;  
 $n_i^{1979}$  --the coefficient of the birth rate for 1979 among women of the given age with  $i$  level of education;  
 $S^{1982}$  --the overall number of women of a given age in 1982.



Indicators for 1979 were taken as a standard. The total is taken in terms of 1, that is, for all of the separate values of the level of education.

The fraction in the numerator of the formula indicates the "expected" number of women of 1 level of education which would bear children in 1982 with the same level of birth rate in this education group as existed in 1979. The coefficient of the whole characterizes the average degree of change in the intensiveness of the birth rate in terms of the level of education.

For convenience the calculations of formula (3) can be changed as follows:

$$n_{\text{stan}}^{1982} = \frac{1}{\sum_i N_i^{1982}} \cdot \frac{\pi_i^{1979}}{\pi_i^{1979}}$$

The comparison  $n_{\text{stan}}^{1982}$  with  $n^{1982}$  and the actual numbers will show how much the change in the birth rate among women with various levels of education affected the overall level of the birth rate.

In the example we discussed indicators for only one age group. The average indicator for all ages can be calculated by making similar calculations for each age group and weighing the age indicators in terms of one or another (depending on the purpose of the analysis) age structure. If, for example, it is necessary to clarify the effect of the change in the level of education "in pure form," then the age structure can be taken as identical for 1979 and for 1982.

One can calculate analogously the indicators standardized not only in terms of the level of education, but also in terms of other information, including indicators not only of birth rate, but also death rate, the marriage rate and the divorce rate.

The device of standardization makes it possible not only to compare indicators by eliminating the effect of the composition of the population, but also to clarify, as was shown at the beginning of the article, the comparative influence on the overall indicator of the change in the composition of the compared populations and the change in the coefficients. Which had a greater influence on the change in the overall coefficient of the birth rate in our example--the change in the levels of the birth rate in the city and in the country or the change in the distribution of the population into urban and rural populations? To answer this it is necessary to divide the overall coefficient for 1973 by multipliers in the following way

$$17,6\text{‰} = 45,5\text{‰} \cdot \frac{17,6}{18,4} \cdot \frac{18,4}{45,5} = 45,5\text{‰} \cdot 0,957 \cdot 0,404 = 45,5\text{‰} \cdot 0,387.$$

The first fraction shows the effect of the change in the composition of the population, the second--the effect of the change of the coefficients of the birth rate. It is clear that the main role was played by the reduction of the coefficients of the birth rate both in the city and in rural areas. If it had not decreased (i. e. if the latter fraction were not there), the overall coefficient of the birth rate would have decreased to

$$45,5\text{‰} \cdot \frac{17,6}{18,4} = 45,5\text{‰} \cdot 0,957 = 43,5\text{‰}.$$

Thus standardization is also applicable for analyzing the factors in the change in demographic coefficients. Its shortcoming, however, consists in that standardized indicators, although they are comparable, are still somewhat artificial. Moreover, they do not show by how much the effect of one factor is stronger than that of the other. A comparative quantitative evaluation of them is provided by the method of dividing the increase in the coefficient by its components.

Dividing the increase in the coefficients by its components. At the beginning of the discussion, the overall coefficient of the birth rate was represented as the process of two quantities: the special coefficient of the birth rate ( $N/f = f$ ) and the proportion of women 15-49 years of age in the total population ( $F/S = d$ ).

$$n = f \cdot d.$$

Let us say that we have data about the values of both co-multipliers for two years (we shall designate the initial level by the superscript  $^0$ , and the final one by superscript  $^1$ ). We shall indicate the increase in each parameter by the letter to the left of its designation. Then:

the increase in the overall coefficient of the birth rate	$\Delta n = n^1 - n^0$ ;
the increase in the special coefficient of the birth rate	$\Delta f = f^1 - f^0$ ;
the increase in the proportion of women 15-49 years of age in the population	$\Delta d = d^1 - d^0$ .

The increase in the overall coefficient of the birth rate can be divided into three parts\*

$$\Delta n = d^0 \Delta f + f^0 \Delta d + \Delta f \Delta d. \quad (4)$$

The first two terms show the "peer" effect of each component on the increase in the overall coefficient:

The first term indicates how much the overall coefficient of the birth rate would have increased as a result of a change in the special coefficient of the birth rate alone ( $\Delta f$ ), if the proportion of women 15-49 years of age in the population ( $d^0$ ) remained at the initial level;

The second term indicates how much the overall coefficient of the birth rate would have increased as a result of a change only in the proportion of women 15-49 years of age in the population ( $\Delta d$ ), if the special coefficient of the birth rate ( $f^0$ ) had remained at the initial level;

the third term characterizes the interaction of the component-factors. Interaction is understood to mean the additional increase in one of the components brought about by an increase in the other component with a mutual change in both. If, for

\*The approach to dividing the increase in the overall coefficient into components is presented in an article by L. V. Korovina, "Separating out the Structural Components of Coefficients of the Birth Rate," in the book "Narodnaceniyeye SSSR i nekotorykh zarubezhnykh stran (problemy, metodologiya i metody izucheniya)" [The Population of the USSR and Certain Foreign Countries (Problems, Methodology and Methods of Study)], Moscow, Statistika, 1975, pp 94-105.

example, the number of women 15-49 years of age increased, this increase would produce a certain additional number of births even if the level of the birth rate remained unchanged. And with an increase in the birth rate this additional number of births would be even greater. The interaction will show how much the overall coefficient will increase as a result of an increase in the birth rate of the same number of women for which the birth-giving contingent increased. The interaction can also be negative if one component increases while the other one decreases. In this case it can be interpreted as part of the reduction of the overall coefficient as a result of which, say, the number of women decreased, and therefore did not give birth to children which could have been born as a result of an increase in the special coefficient of the birth rate. Thus a change in the overall coefficient of the birth rate ( $n$ ) can be represented as the sum of "pure" changes under the influence of each of the components and their interaction. This will make it possible to evaluate the "contribution" of each component to the overall change in the coefficient.

The upper part of Table 3 gives an example of this division of the overall coefficient of the birth rate according to data from the example in Table 1. In 1965 this coefficient was 17.35%, and in 1975--18.92%, that is, during ten years it increased by 1.57%. The first line of the table contains all the initial data (columns 2-7) and the results of the calculation according to formula 3 (they have been reduced to % in columns 8-11). It is apparent that a reduction in the special coefficient reduced the overall coefficient of the birth rate by 0.07%, and an increase in the proportion of women 15-49 years of age in the population increased it by 1.65% with a negligible (-0.01%) negative interaction. In the second line the same results are given for clarity in percentages of the initial level of the overall coefficient. As one can see, the change in the age structure plays the main role.

It is possible to divide up the change in the special coefficient of the birth rate in an analogous way. This time the components of the change will be the "pure" effect of the change in age coefficients of the birth rate ( $N_x/F_x = f_x$ ) and the proportion of women of each age in the overall number of women 15-49 years of age ( $F_x/F = h_x$ ) and also their interaction. As before, we shall designate the increase in age coefficients of the birth rate by  $\Delta f_x = f_x^1 - f_x^0$ , and the increase in the proportion of women of each age (now no longer in the population, but in the overall number of women of childbearing age) by  $\Delta h_x = h_x^1 - h_x^0$ . The increase in the special coefficient will be

$$\Delta f = \sum h_x^0 \cdot \Delta f_x + \sum f_x^0 \Delta h_x + \sum \Delta f_x \Delta h_x. \quad (5)$$

The total in each term on the right hand side of formula 5 embraces the interval of 15-49 years. This division makes it possible to evaluate the "contribution" made by each age group to the overall change in the coefficient in addition to the influence of each of the factors. The initial data and the results of the calculation are presented in the lower part of Table 3.

The special coefficient of the birth rate decreased during the ten years by 0.30% (line 1, columns 2-4). From line 10 (columns 8-11) it is clear that the reduction in the age coefficients affecting all age groups (column 8) reduced the special

Table 3. Components of Change in Overall Coefficient of Birth Rate (1965-1975)

		(12) Началь- ный уро- вень 1965 г.	(13) Конеч- ный уро- вень 1975 г.	(14) Прирост	(15) Изменение рождае- мости	(16) Изменение структуры	(17) Изменение действия	(18) Изменение			
		2	3	4	5	6	7	8	9	10	11
Разложение общего коэффициента рождаемости (20)											
(21) Специальный коэф- фициент рождаемости, ‰											
(22) Доля женщин 15-49 лет в населении											
(23) Разложение специального коэффициента рождаемости (23)											
(24) Возрастные коэф- фициенты рождаемости, ‰											
(25) Доля женщин данного возраста среди женщин 15-49 лет											
Возраст женщин											
3. 15-19 лет											
4. 20-24 года											
5. 25-29 лет											
6. 30-34 года											
7. 35-39 лет											
8. 40-44 года											
9. 45-49 лет											
10. Сумма строк 3-9. Компоненты изменения в ‰											
11. В ‰ к начальному уровню специального коэффициента рождаемости (71.60‰)											

[Key on following page]



Table 3.

Key:

1. Initial data and components of change, in %.
2. In % of initial level of overall coefficient of birth rate (17.35%)  
Ages of women
3. 15-19
4. 20-24
5. 25-29
6. 30-34
7. 35-39
8. 40-44
9. 45-49
10. Total of lines 3-9. Components of change in %.
11. In % of initial level of special coefficient of birth rate (71.60%)
12. Initial level, 1965
13. Final level, 1975
14. Increase
15. Influence
16. Change in birth rate
17. Change in age structure
18. Interaction
19. Overall change
20. Breakdown of overall coefficient of birth rate
21. Special coefficient of birth rate %.
22. Proportion of women 15-49 years of age in the population
23. Breakdown of special coefficient of birth rate
24. Age coefficients of birth rate, %.
25. Proportion of women of given age among women 15-49 years of age

coefficient complexly by 6.78% or by 9.5% of its initial level (line 11), which was almost compensated for the relative improvement in the age structure of women (it produced an increase of 6.30%). The greatest effect in this respect was produced by the increase in the proportion of women in the group 20-24 years of age (line 4), that is, in the age when the birth rate is highest, and an insignificant increase in the group 25-29 years of age, while in the ages 30-44 the reduction in the proportion of women reduced the special coefficient of the birth rate.

It is possible, finally, to divide up the overall coefficient taking into account the changes in the age coefficients of the birth rate. To do this it is necessary to substitute the value  $f$  from formula 5 into figure 4 and then to add all the interactions, that is, to add  $f$  and  $d$  and  $d^0 f_x h_x$ . Then the increase in the overall coefficient of the birth rate can be represented as

$$\Delta n = d^0 \Sigma h_x^0 \Delta f_x + d^0 \Sigma f_x^0 \Delta h_x + f^0 \Delta d + B. \quad (6)$$

where B--the sum of interaction and the other three terms on the right hand side of the equation characterize, correspondingly, the "pure" effect of the change of the age coefficients of the birth rate, the age structure of the childbearing contingent and the proportion of women 15-49 years of age in the population. Let us make this calculation from data in Table 3. The brackets indicate the sum of all interactions.

$$\Delta n = 0,242 \cdot (-6,78) + 0,242 \cdot 6,30 + 71,60 \cdot 0,023 + \\ + [(-0,30) \cdot 0,023 + 0,242 \cdot 0,18] = -1,64 + 1,52 + 1,65 + 0,04 = 1,57\%.$$

In percentages of the initial level

$$9.0 = -9.5 + 8.8 + 9.5 + 0.2$$

This division makes it possible to explain the fact, which is paradoxical at first glance, that with a reduction in all age coefficients, the birth rate, the overall coefficient increased. This took place because of the sharp increase in the age structure of the childbearing contingent and the increase in its proportion in the population. The reason for this has already been given.

It is also possible, of course, to divide general and special coefficient of marriage and divorce rates into components in a similar way. This method is suitable for comparing factors in various coefficients among individual territories. It would be interesting, in particular, to use this device to explain the role in the reduction of coefficients of the birth rate that is played by the change in the age structure which is brought about by the migration of youth from rural localities in several oblasts that have a low level of increase in the population.

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